

**SPIN VALVE SENSOR FREE LAYER STRUCTURE
WITH A COBALT BASED LAYER THAT PROMOTES
MAGNETIC STABILITY AND HIGH MAGNETORESISTANCE**

ABSTRACT OF THE DISCLOSURE

5 A method of making a nickel iron (NiFe) layer and a cobalt or cobalt based
layer of a free layer structure forms the cobalt or cobalt based layer by oblique ion
beam sputter deposition with the cobalt or cobalt based layer located between the
nickel iron (NiFe) layer and a copper (Cu) spacer layer of a spin valve sensor for
reducing hard axis coercivity H_{CH} which increases sensitivity and magnetic stability of
10 a magnetic read head. An alpha iron oxide (αFeO) layer on a nickel oxide (NiO)
layer of a pinning layer may also be obliquely ion beam sputtered for improving
magnetic stability of the read head.